

**IN THE DRAWINGS:**

The designations “(*PRIOR ART*)” have been removed from each of Figs. 1, 2, 3, and 4, as these drawings do not illustrate prior art but, rather, show why existing technologies could not be used to attach semiconductor devices with certain types of connection patterns in a desired manner.

Marked-up drawings showing the corrections and replacement drawings are enclosed herewith.

## REMARKS

The Office Action dated June 1, 2005, has been received and reviewed.

Claims 38 – 69 are currently pending and under consideration in the above-referenced application. Each of claims 38 – 69 stands rejected.

The designations “(*PRIOR ART*)” have been removed from each of Figs. 1, 2, 3, and 4, as these drawings do not illustrate prior art but, rather, show why existing technologies could not be used to attach semiconductor devices with certain types of connection patterns in a desired manner.

Marked-up drawings showing the corrections and replacement drawings are enclosed herewith.

Reconsideration of the above-referenced application is respectfully requested.

## Rejections Under 35 U.S.C. § 102

Claims 38 – 43, 48 – 61, and 64 – 69 stand rejected under 35 U.S.C. § 102(e).

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference which qualifies as prior art under 35 U.S.C. § 102. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

With respect to inherency, M.P.E.P. § 2112 provides:

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) . . . ‘To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill . . .’’ *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1991).

Potter

Claims 38–43, 48–61, and 64–69 stand rejected under 35 U.S.C. § 102(e) for reciting subject matter which is purportedly anticipated by that described in U.S. Patent 6,292,007 to Potter (hereinafter “Potter”).

Amended independent claim 38 recites a semiconductor device comprising, *inter alia*, contact pads arranged in at least one substantially linear relationship positioned at or proximate with the *center line* of a substrate. The contact pads are configured to communicate with corresponding test pads of a test substrate. The semiconductor device is further comprised of at least one stabilizer protruding from the surface configured to at least *partially stabilize* an orientation of the semiconductor device over the test substrate and *including a plurality of adjacent, mutually adhered regions of the same material*.

Potter discloses an apparatus for a semiconductor device that use compliant probe tips to assure planarization between the probe assembly and a device under test. In particular, the method Potter discloses uses a large force to ensure contact with the pad on the device under test and the probes. Col. 1, lines 37 – 40. The device under test is “*mounted on the package lid 111 by a layer of bonding material 113.*” Col. 3, lines 28 – 30. (N.B. Figure 1 misidentifies the bonding material 113 as bonding material 116, and vice versa. As the text makes clear, bonding material 113 mounts the device under the test 101 to the lid 111 and bonding material 116 mounts the probe membrane 120 in the recessed portion 115 of the package 110. Col. 3, lines 28–30, 35–36; Col. 4, lines 45 – 47.) To ensure contact, the probe tips 122 are manufactured in such way as to deform under the force used to ensure contact. Col. 4, lines 5 – 11. The method uses standoffs 123 designed to prevent the applied force used to ensure contact from deforming the probe tips beyond their elastic limit when testing a device. Fig. 1; Col. 4, lines 13 – 15. These standoffs 123 are manufactured on the probe membrane 120 from metal or a polymer material. Col. 4, lines 17 – 18.

Potter, however, fails to anticipate amended independent claim 38 because it does not disclose each and every element as set forth in the claim, either expressly or inherently. Specifically, Potter fails to disclose contact pads disclosed in a substantially linear manner proximate to the centerline of the semiconductor device. Indeed, Fig. 2 illustrates this point with

a top view of the probe head assembly with probe tips that mirror the arrangement of the input/output pads of the device under test. Fig. 2; Col. 3, lines 55 – 58.

Further, the standoffs that Potter discloses cannot act as the stabilizers in independent claim 38 for several reasons. First, the standoffs are disposed upon the probe membrane, not the semiconductor device, whereas independent claim 38 recites a semiconductor comprising a stabilizer. Second, the standoffs serve to prevent the applied force from exceeding the elastic limits of the probe tips, *not* as a stabilizer configured to partially stabilize the device under test. Third, the device under test is *mounted to the package lid with a bonding layer*. Col. 3, lines 28–30. Because the device under test is mounted to the lid, no reason exists to have a stabilizer present to partially stabilize the device under test and the standoffs Potter discloses never could stabilize the device. Additionally, Potter does not disclose discloses, either expressly or inherently, that the standoffs include a plurality of adjacent, mutually adhered layers of the same material. Rather, Potter mentions only that the standoffs may be fabricated from metal or of a polymer. The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993). Therefore, Potter fails to anticipate each and every element of amended independent claim 38 and the withdrawal of the 35 U.S.C. § 102(e) rejection is respectfully requested.

Claims 39–43 and 48–52 are each allowable, among other reasons, as depending either directly or indirectly upon allowable amended independent claim 38.

Claim 42 is additionally allowable because Potter does not disclose a stabilizer comprising a photopolymer.

Claim 48 is additionally allowable because Potter does not disclose a stabilizer elongated in a direction parallel to a place in which the substrate is located.

Claim 49 is additionally allowable because Potter fails to disclose a semiconductor device wherein the substrate comprises a semiconductor wafer. Potter only discloses the use of a multichip module (MCM) in the context of the test substrate, the probe tips of the MCM arranged to match the positions of the input/output pads of the device under test. Col. 1, lines 29–34.

Claim 51 is additionally allowable because Potter fails to disclose a semiconductor device wherein the substrate comprises a chip-scale package. Potter only discloses the use of a multichip module (MCM) in the context of the test substrate, the probe tips of the MCM arranged to match the positions of the input/output pads of the device under test. Col. 1, lines 29–34.

Claim 52 is additionally allowable because Potter does not disclose a test substrate with a stabilizer configured to partially stabilize the semiconductor device. This is so because the device under test is *mounted to the package lid with a bonding layer*. Col. 3, lines 28–30. Because the device under test is mounted to the lid, no reason exists to have a stabilizer present to partially stabilize the device under test and the standoffs Potter discloses never could stabilize the device.

Amended independent claim 53 recites a test substrate comprising, among others, test pads arranged in at least one substantially linear relationship positioned at or proximate a centerline of a semiconductor device disposed over the substrate. In addition, the test substrate comprises at least one stabilizer configured to at least *partially stabilize* an orientation of the semiconductor device over the test substrate and *including a plurality of adjacent, mutually adhered regions of the same material*.

Potter fails to anticipate amended independent claim 53 because it does not disclose each and every element as set forth in the claim, either expressly or inherently. Specifically, Potter fails to disclose test pads disposed in a substantially linear manner proximate to the centerline of the semiconductor device disposed over the test substrate. Indeed, Fig. 2 illustrates this point with a top view of the probe head assembly with probe tips that mirror the arrangement of the input/output pads of the device under test wherein the probe tips are arranged proximate to the periphery of the probe head assembly. Fig. 2; Col. 3, lines 55–58.

Further, the standoffs that Potter discloses cannot act as the stabilizers in claim 53 for several reasons. First, the standoffs serve to prevent the applied force from exceeding the elastic limits of the probe tips, *not* as a stabilizer configured to partially stabilize the device under test. Second, the device under test is *mounted to the package lid with a bonding layer*. Col. 3, lines 28–30. Because the device under test is mounted to the lid, no reason exists to have a stabilizer

present to partially stabilize the device under test and the standoffs Potter discloses never could stabilize the device. Therefore, Potter fails to anticipate each and every element of amended independent claim 53 and the withdrawal of the 35 U.S.C. § 102(e) rejection is respectfully requested.

Claims 54 – 59 are each allowable as depending either directly or indirectly upon allowable amended independent claim 53.

Claim 56 is additionally allowable because Potter fails to discloses a stabilizer comprising a photopolymer.

Claim 57 is additionally allowable because Potter fails to discloses a stabilizer comprising a photopolymer that is at least semisolid.

Claim 58 is additionally allowable because Potter does not disclose discloses, either expressly or inherently, that the standoffs include a plurality of adjacent, mutually adhered layers of the same material. Rather, Potter mentions only that the standoffs may be fabricated from metal or of a polymer. The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

Claim 59 is additionally allowable because Potter fails to disclose a semiconductor with a stabilizer secured to the surface thereof.

Independent claim 60 recites an assembly of a semiconductor device and a test substrate comprising, among other things, a plurality of contact pads arranged in at least one substantially linear relationship located at or proximate a centerline of a semiconductor device. In addition, the assembly further comprises at least one stabilizer disposed between the test substrate and the semiconductor device.

Potter fails to anticipate independent claim 60 because it does not disclose each and every element as set forth in the claim, either expressly or inherently. Specifically, Potter fails to disclose contact pads disclosed in a substantially linear manner proximate to the centerline of the semiconductor device. Indeed, Fig. 2 illustrates this point with a top view of the probe head assembly with probe tips that mirror the arrangement of the input/output pads of the device under test. Fig. 2; Col. 3, lines 55–58.

Further, the standoffs that Potter discloses cannot act as the stabilizers in claim 60 for several reasons. First, the standoffs serve to prevent the applied force from exceeding the elastic limits of the probe tips, *not* as a stabilizer configured to partially stabilize the device under test. Second, the device under test is *mounted to the package lid with a bonding layer*. Col. 3, lines 28–30. Because the device under test is mounted to the lid, no reason exists to have a stabilizer present to partially stabilize the device under test and the standoffs Potter discloses never could stabilize the device. Therefore, Potter fails to anticipate each and every element of amended claim 60 and the withdrawal of the 35 U.S.C. § 102(e) rejection is respectfully requested.

Claims 61 and 64 – 69 are each allowable as depending either directly or indirectly upon allowable amended independent claim 60.

Claim 64 is additionally allowable because Potter does not disclose a stabilizer comprising a photopolymer.

Claim 65 is additionally allowable because Potter fails to disclose that the photopolymer is at least semisolid.

Claim 66 is additionally allowable because Potter does not disclose discloses, either expressly or inherently, that the standoffs include a plurality of adjacent, mutually adhered layers of the same material. Rather, Potter mentions only that the standoffs may be fabricated from metal or of a polymer. The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

Johnson

Claims 38 – 43, 48 – 61, and 64 – 69 stand rejected under 35 U.S.C. § 102(e) for reciting subject matter which is purportedly anticipated by that described in U.S. Patent 6,469,530 to Johnson, *et al.* (hereinafter “Johnson”).

Amended independent claim 38 recites, *inter alia*, a semiconductor device comprised of a substrate having contact pads arranged in at least one substantially linear relationship positioned at or proximate a centerline of the substrate and at least one stabilizer protruding from the surface

configured to at least partially stabilize an orientation of the semiconductor device over the test substrate and *including a plurality of adjacent, mutually adhered regions of the same material.*

Johnson discloses a ball grid assembly that provides enhanced connection between test probe connections and the ball grid array circuits. Col. 2, lines 45–49. The ball grid assembly circuits may assume a variety of configurations, including non-symmetric configurations. Col. 5, lines 30–38, 61–67. Mounted to the printed circuit board (PCB) and located between the PCB and the BGA are standoff spacers or supports 28. Fig. 1; Col. 5, lines 34–36. The spacers may be comprised of elastomeric material or circuit components. Col. 5, lines 41–46.

Johnson fails to anticipate amended independent claim 38 because it does not disclose each and every element as set forth in the claim, either expressly or inherently. First, the standoffs that Johnson discloses are mounted to the PCB, *not* the semiconductor device. Second, the BGA assemblies that Johnson discloses are symmetric with balls surrounding the periphery of the semiconductor die and do not require the standoffs to stabilize their disposition over the test substrate. FIGs. 2A and 2B. Specifically, Johnson fails to disclose a BGA assembly with a substantially linear relationship proximate a centerline of the semiconductor device with at least one stabilizer that at least partially stabilizes the semiconductor device disposed over the test substrate. Therefore, Johnson fails to disclose the identical invention in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Third, Johnson does not disclose, either expressly or inherently, that the standoffs include a plurality of adjacent, mutually adhered layers of the same material. Rather, Johnson mentions only that the standoffs may be fabricated from elastomeric material or circuit components. The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993). Therefore, Johnson fails to anticipate each and every element of amended claim 38 and the withdrawal of the 35 U.S.C. § 102(e) rejection is respectfully requested.

Claims 39–43 and 48–52 are each allowable as depending either directly or indirectly upon allowable amended independent claim 38.

Claim 42 is additionally allowable because Johnson never discloses a stabilizer comprising a photopolymer.

Claim 48 is additionally allowable because Johnson does not disclose a stabilizer elongated in a direction parallel to a place in which the substrate is located.

Claim 49 is additionally allowable because Johnson fails to disclose a semiconductor device wherein the substrate comprises a semiconductor wafer. Johnson only discloses the use of a BGA and a printed circuit board in the context of the test substrate. FIG. 1; Col. 4, lines 39–46.

Amended independent claim 53 recites a test substrate comprising, among other things, test pads configured to communicate with corresponding contact pads arranged in at least one substantially linear relationship positioned at or proximate a centerline of the substrate and at least one stabilizer configured to at least *partially stabilize* an orientation of the semiconductor device upon disposal over the test substrate.

Johnson discloses a ball grid assembly that provides enhanced connection between test probe connections and the ball grid array circuits. Col. 2, lines 45–49. The BGA circuits may assume a variety of configurations, including non-symmetric configurations. Col. 5, lines 30–38, 61–67. Mounted to the printed circuit board (PCB) and located between the PCB and the BGA are standoff spacers or supports 28. Fig. 1; Col. 5, lines 34–36. The spacers may be comprised of elastomeric material or circuit components. Col. 5, lines 41–46.

Johnson fails to anticipate because it does not disclose each and every element as set forth in the claim, either expressly or inherently. In particular, the BGA assemblies that Johnson discloses are symmetric with balls surrounding the periphery of the semiconductor die and do not require the standoffs to stabilize their disposition over the test substrate. FIGs. 2A and 2B. Specifically, Johnson fails to disclose a BGA assembly with a substantially linear relationship proximate a centerline of the semiconductor device with at least one stabilizer that at least partially stabilizes the semiconductor device disposed over the test substrate. Therefore, Johnson fails to disclose the identical invention in as complete detail as is contained in the claim.

*Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Thus, Johnson fails to

anticipate each and every element of amended independent claim 53 and the withdrawal of the 35 U.S.C. § 102(e) rejection is respectfully requested.

Claims 54–59 are each allowable as depending either directly or indirectly upon allowable amended independent claim 53.

Claim 56 is additionally allowable because Johnson never discloses a stabilizer comprising a photopolymer.

Claim 57 is additionally allowable because Johnson never discloses a stabilizer comprising a photopolymer that is at least semisolid.

Amended claim 58 is additionally allowable because Johnson does not disclose, either expressly or inherently, that the standoffs include a plurality of adjacent, mutually adhered layers of the same material. Rather, Johnson mentions only that the standoffs may be fabricated from elastomeric material or circuit components. The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

Independent claim 60 recites an assembly of a semiconductor device and a test substrate comprising, among others, a semiconductor device with a plurality of contact pads arranged in at least one substantially linear relationship located at or proximate a centerline of the semiconductor device and at least one stabilizer disposed between the test substrate and the semiconductor device.

Johnson fails to independent claim 60 because it does not disclose each and every element as set forth in the claim, either expressly or inherently. In particular, the BGA assemblies that Johnson discloses are symmetric with balls surrounding the periphery of the semiconductor die and do not require the standoffs to stabilize their disposition over the test substrate. FIGs. 2A and 2B. Specifically, Johnson fails to disclose a BGA assembly with a substantially linear relationship proximate a centerline of the semiconductor device with at least one *stabilizer* disposed between the test substrate and the semiconductor device. Therefore, Johnson fails to disclose the identical invention in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Thus, Johnson fails to anticipate each and every element of amended claim 53 and the withdrawal of the 35 U.S.C.

§ 102(e) rejection is respectfully requested. Therefore, Johnson fails to anticipate each and every element of independent claim 60 and the withdrawal of the 35 U.S.C. § 102(e) rejection is respectfully requested.

Claim 61 and 64–69 are each allowable as depending either directly or indirectly upon allowable independent claim 60.

Claim 64 is additionally allowable because Johnson does not disclose a stabilizer comprising a photopolymer.

Claim 65 is additionally allowable because Johnson fails to disclose that the photopolymer is at least semisolid.

Amended claim 66 is additionally allowable because Johnson fails to discloses, either expressly or inherently, that the standoffs include a plurality of adjacent, mutually adhered layers of the same material. Rather, Johnson mentions only that the standoffs may be fabricated from metal or of a polymer. The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

#### Higgins

Claims 38–43, 48–61, and 64–69 stand rejected under 35 U.S.C. § 102(e) for reciting subject matter which is purportedly anticipated by that described in U.S. Patent 5,985,682 to Higgins, III (hereinafter “Higgins”).

Amended independent claim 38 recites a semiconductor device comprising, *inter alia*, contact pads arranged in at least one substantially linear relationship positioned at or proximate with the *center line* of a substrate. The contact pads are configured to communicate with corresponding test pads of a test substrate. The semiconductor device is further comprised of at least one stabilizer protruding from the surface configured to at least *partially stabilize* an orientation of the semiconductor device over the test substrate and *including a plurality of adjacent, mutually adhered regions of the same material*.

Higgins discloses a method of testing bumped semiconductor die without excessively deforming the semiconductor bumps. Col 2, lines 31–32. In particular, the method Higgins

discloses uses a force to ensure contact with conductive bumps 200 on the die and the conductive pad 210 on the test contactor 12. FIG. 2; Col. 4, lines 4–15, 25–30. The method uses deformable standoffs 216 which permit “the force delivery system 24 to compress conductive bumps 200 and deformable layer 204 only to a certain extent. Beyond that extent, mechanical standoff 216 directly touches the surface of die 14, preventing additional closure,” when testing a device. Fig. 2; Col. 4, lines 48–53. These standoffs 216 protrude above the surface of the test contactor or the die and are manufactured from nickel. Col. 4, lines 37–39, 53–55, 62–67.

Higgins, however, fails to anticipate amended independent claim 38 because it does not disclose each and every element as set forth in the claim, either expressly or inherently. Specifically, Higgins fails to disclose contact pads disclosed in a substantially linear manner proximate to the centerline of the semiconductor device. Further, the standoffs that Higgins discloses cannot act as the stabilizers in claim 38 for several reasons. First, the standoffs are disposed upon the test contactor, not the semiconductor device. Second, the standoffs act to limit the compression of the conductive bumps, *not* as a stabilizer configured to partially stabilize the device under test. Finally, Higgins does not discloses, either expressly or inherently, that the standoffs include a plurality of adjacent, mutually adhered layers of the same material. Rather, Higgins mentions only that the standoffs may be fabricated from nickel. The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993). Therefore, Higgins fails to anticipate each and every element of amended independent claim 38 and the withdrawal of the 35 U.S.C. § 102(e) rejection is respectfully requested.

Claims 39–43 and 48–52 are each allowable as depending either directly or indirectly upon allowable amended independent claim 38.

Claim 41 is additionally allowable because Higgins never discloses a stabilizer comprises a dielectric material.

Claim 42 is additionally allowable because Higgins never discloses a stabilizer comprising a photopolymer.

Claim 48 is additionally allowable because Higgins does not disclose a stabilizer elongated in a direction parallel to a place in which the substrate is located.

Claim 49 is additionally allowable because Higgins fails to disclose a semiconductor device wherein the substrate comprises a semiconductor wafer. Higgins only discloses the use of a test contactor.

Claim 51 is additionally allowable because Higgins fails to disclose a semiconductor device wherein the substrate comprises a chip scale package.

Claim 52 is additionally allowable because Higgins does not disclose a test substrate with a stabilizer configured to partially stabilize the semiconductor device. Higgins discloses standoffs that act to limit the compression of the conductive bumps, *not* as a stabilizer configured to partially stabilize the device under test.

Amended independent claim 53 recites a test substrate comprising, among others, test pads arranged in at least one substantially linear relationship positioned at or proximate a centerline of a semiconductor device disposed over the substrate. In addition, the test substrate comprises at least one stabilizer configured to at least *partially stabilize* an orientation of the semiconductor device over the test substrate.

Higgins discloses a method of testing bumped semiconductor die without excessively deforming the semiconductor bumps. Col 2, lines 31–32. In particular, the method Higgins discloses uses a force to ensure contact with conductive bumps 200 on the die and the conductive pad 210 on the test contactor 12. FIG. 2; Col. 4, lines 4–15, 25–30. The method uses deformable standoffs 216 which permit “the force delivery system 24 to compress conductive bumps 200 and deformable layer 204 only to a certain extent. Beyond that extent, mechanical standoff 216 directly touches the surface of die 14, preventing additional closure,” when testing a device. Fig. 2; Col. 4, lines 48–53. These standoffs 216 protrude above the surface of the test contactor or the die and are manufactured from nickel. Col. 4, lines 37–39, 53–55, 62–67.

Higgins fails to anticipate amended independent claim 53 because it does not disclose each and every element as set forth in the claim, either expressly or inherently. Specifically, Higgins fails to disclose contact pads disclosed in a substantially linear manner proximate to the centerline of the semiconductor device. In addition, the standoffs that Higgins discloses cannot

act as the stabilizers in amended independent claim 53 because the standoffs of Higgins act to limit the compression of the conductive bumps, *not* as a stabilizer configured to partially stabilize the device under test. Therefore, Higgins fails to anticipate each and every element of amended independent claim 53 and the withdrawal of the 35 U.S.C. § 102(e) rejection is respectfully requested.

Claims 54–59 are each allowable as depending either directly or indirectly upon allowable amended independent claim 53.

Claim 56 is additionally allowable because Higgins never discloses a stabilizer comprising a photopolymer.

Claim 57 is additionally allowable because Higgins never discloses a stabilizer comprising a photopolymer that is at least semisolid.

Amended claim 58 is additionally allowable because Higgins does not disclose, either expressly or inherently, that the standoffs include a plurality of adjacent, mutually adhered layers of the same material. Rather, Higgins mentions only that the standoffs may be fabricated from nickel. The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

Claim 59 is additionally allowable because Higgins fails to disclose a semiconductor with a stabilizer secured to the surface thereof.

Independent claim 60 recites an assembly of a semiconductor device and a test substrate comprising, among others, a plurality of contact pads arranged in at least one substantially linear relationship located at or proximate a centerline of a semiconductor device. In addition, the assembly further comprises at least one stabilizer disposed between the test substrate and the semiconductor device.

Higgins fails to anticipate amended claim 60 because it does not disclose each and every element as set forth in the claim, either expressly or inherently. Specifically, Higgins fails to disclose contact pads disclosed in a substantially linear manner proximate to the centerline of the semiconductor device. Further, the standoffs that Higgins discloses cannot act as the stabilizers in independent claim 60 because the standoffs in Higgins act to limit the compression of the

conductive bumps, *not* as a stabilizer disposed between the test substrate and the semiconductor device. Therefore, Higgins fails to anticipate each and every element of independent claim 60 and the withdrawal of the 35 U.S.C. § 102(e) rejection is respectfully requested.

Claims 61 and 64–69 are each allowable as depending either directly or indirectly upon allowable independent claim 60.

Claim 64 is additionally allowable because Higgins does not disclose a stabilizer comprising a photopolymer.

Claim 65 is additionally allowable because Higgins fails to disclose that the photopolymer is at least semisolid.

Amended claim 66 is additionally allowable because Higgins does not discloses, either expressly or inherently, that the standoffs include a plurality of adjacent, mutually adhered layers of the same material. Rather, Higgins mentions only that the standoffs may be fabricated from nickel. The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

#### **Rejections Under 35 U.S.C. § 103(a)**

Claims 38–69 stand rejected under 35 U.S.C. § 103(a).

The standard for establishing and maintaining a rejection under 35 U.S.C. § 103(a) is set forth in M.P.E.P. § 706.02(j), which provides:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicants disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Purported APA, in view of Hashimoto

Claims 38–41, 45–55, 58–63, and 66–69 stand rejected under 35 U.S.C. § 103(a) for reciting subject matter which is assertedly unpatentable over applicant's admitted prior art (APA) in combination with U.S. Patent 6,410,366 to Hashimoto (hereinafter "Hashimoto").

Amended claim 38 recites a semiconductor device comprising, *inter alia*, at least one stabilizer protruding from the surface configured to at least partially stabilize an orientation of the semiconductor device over the *test substrate* and *including a plurality of adjacent, mutually adhered regions of the same material*.

The Purported APA upon which the Office relies in part teaches a semiconductor device 200 assembled with a test substrate 210 in a face-down configuration, with contact pads 202 temporarily connected to their corresponding test pads 230. Purported APA does not teach, as Examiner acknowledges at Office Action of June 1, 2005, pg. 7, the use of stabilizers to stabilize an orientation of the semiconductor device in a plane substantially parallel to the test substrate 210, let alone stabilizers comprised of a plurality of adjacent, mutually adhered regions.

Hashimoto teaches forming bumps 11 on the active surface of a semiconductor die 10. FIG. 1A; col. 5, lines 34-38. Hashimoto also teaches forming bumps 21 on the substrate 20. Further, each bump 11 and 21 may be formed of an electrically insulating material, col. 5, lines 41-43, col. 7, lines 5-6, or, instead, "may function as electrodes 12 (may form electrical contacts)." Col. 5, lines 54-56. *The bumps are disposed on a semiconductor device and permanent substrate bonded together with anisotropic, or so-called "z-axis," conductive material.* Col. 7, lines 38-40.

However, contrary to Examiner's assertion in the Office Action of June 1, 2005, pg. 8, at no point does Hashimoto teach a stabilizer comprised of a plurality of adjacent, mutually adhered regions. Rather, Hashimoto teaches the formation of bumps of an apparently single layer through the use of etching and solder resist, printing, transfer, or inkjet. Col. 9, lines 3-8.

It is respectfully submitted that a *prima facie* case of obviousness has not been established against amended independent claim 38. This is so because the Purported APA and Hashimoto fail to teach or suggest every element of the limitations in amended independent

claim 38. In particular, they fail to teach or suggest a stabilizer formed from a plurality of adjacent, mutually adhered regions. Instead, Hashimoto teaches supports that apparently include only a single layer of electric insulating material and that are formed by etching, solder resist, printing, transfer, or inkjet techniques, not stabilizers manufactured by selective material consolidation processes.

Moreover, neither the Purported APA nor Hashimoto provides a suggestion or motivation to combine the references because Hashimoto teaches *permanently* bonding the semiconductor die to a substrate, not a temporary bond for the purpose of a test. The Examiner apparently has relied completely upon the disclosure of the above-referenced application to provide a teaching that relates to a semiconductor substrate with a plurality of contact pads disposed proximate to the centerline combined with a stabilizer comprising adjacent, mutually adhered regions, indicating that the claim rejections amount to nothing more than improper and impermissible hindsight rejections.

Therefore, in considering the foregoing arguments, the withdrawal of the 35 U.S.C. §103 (a) rejection of amended claim 38 is respectfully requested.

Claims 39–41 and 45–52 are each allowable as depending either directly or indirectly upon allowable amended independent claim 38.

Claim 49 is additionally allowable because both Purported APA and Hashimoto fail to disclose a semiconductor device comprising a semiconductor wafer.

Claim 50 is additionally allowable because both Purported APA and Hashimoto fail to disclose a substrate comprising a chip scale package.

Amended independent claim 53 recites a test substrate comprising, *inter alia*, a substrate having test pads configured to temporarily communicate with corresponding contact pads which are arranged in at least one substantially linear relationship.

As discussed above, neither the Purported APA nor Hashimoto provides a suggestion or motivation to combine the references because Hashimoto teaches *permanently* bonding the semiconductor die to a substrate, not a temporary bond for the purpose of a test. The Examiner apparently has relied completely upon the disclosure of the above-referenced application to provide a teaching of a substrate having test pads configured to temporarily communicate with

corresponding contact pads which are arranged in at least one substantially linear relationship, indicating that the claim rejections amount to nothing more than improper and impermissible hindsight rejections.

Therefore, the withdrawal of the 35 U.S.C. §103 (a) rejection of amended independent claim 53 is respectfully requested.

Claims 54, 55, 58, and 59 are each allowable as depending either directly or indirectly upon allowable amended independent claim 53.

Amended claim 58 is additionally allowable because the Purported APA and Hashimoto fail to teach or suggest a stabilizer formed from a plurality of adjacent, mutually adhered regions. Instead, Hashimoto teaches supports that apparently include only a single layer of electric insulating material and that are formed by etching, solder resist, printing, transfer, or inkjet techniques, not stabilizers manufactured by selective material consolidation processes.

Independent claim 60 recites an assembly of a semiconductor device and a test substrate comprising, *inter alia*, a plurality of contact pads of the semiconductor device in *temporary* communication with a plurality of contact pads on test substrate.

As discussed above with respect to amended independent claim 53, the Purported APA and Hashimoto fail to teach or suggest every element of the limitations in amended claim 60. In particular, they fail to teach or suggest a temporary connection between the contact pads of the semiconductor device and the test substrate. *See* Hashimoto, FIG. 1; Col. 7, lines 41 – 43 (disclosing “The semiconductor chip 10 is subjected to face-down bonding to the substrate 20 with an anisotropic conductive material 40 interposed”).

As discussed above, neither the Purported APA nor Hashimoto provides a suggestion or motivation to combine the references because Hashimoto teaches *permanently* bonding the semiconductor die to a substrate, not a temporary bond for the purpose of a test. The Examiner apparently has relied completely upon the disclosure of the above-referenced application to provide a teaching of a substrate having test pads configured to temporarily communicate with corresponding contact pads which are arranged in at least one substantially linear relationship, indicating that the claim rejections amount to nothing more than improper and impermissible hindsight rejections.

Therefore, the withdrawal of the 35 U.S.C. §103 (a) rejection of amended claim 60 is respectfully requested.

Claims 61 – 63 and 66 – 69 are each allowable as depending either directly or indirectly upon allowable independent claim 60.

Amended claim 66 is additionally allowable because the Purported APA and Hashimoto fail to teach or suggest a stabilizer formed from a plurality of adjacent, mutually adhered regions. Instead, Hashimoto teaches supports that apparently include only a single layer of electric insulating material and that are formed by etching, solder resist, printing, transfer, or inkjet techniques, not stabilizers manufactured by selective material consolidation processes.

Purported APA, in view of Hashimoto and Sasaki

Claims 42, 43, 56, 57, 64, and 65 stand rejected under 35 U.S.C. § 103(a) for reciting subject matter which is assertedly unpatentable over applicant's purported admitted prior art (Purported APA) and Hashimoto as applied to claims 38, 53, and 60 and further in combination with JP Patent 402210329A to Sasaki, *et al.* (hereinafter "Sasaki").

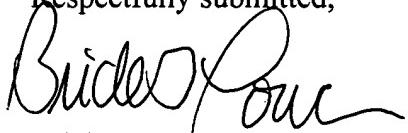
Claims 42, 43, 56, 57, 64 and 65 are each allowable, among other reasons, as depending either directly or indirectly upon allowable independent claims as set forth above.

Therefore, withdrawal of the 35 U.S.C. § 103(a) rejections of claims 42, 43, 56, 57, 64 and 65 is respectfully requested.

## CONCLUSION

It is respectfully submitted that each of claims 38 – 69 is allowable. An early notice of the allowability of each of these claims is respectfully solicited, as is an indication that the above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



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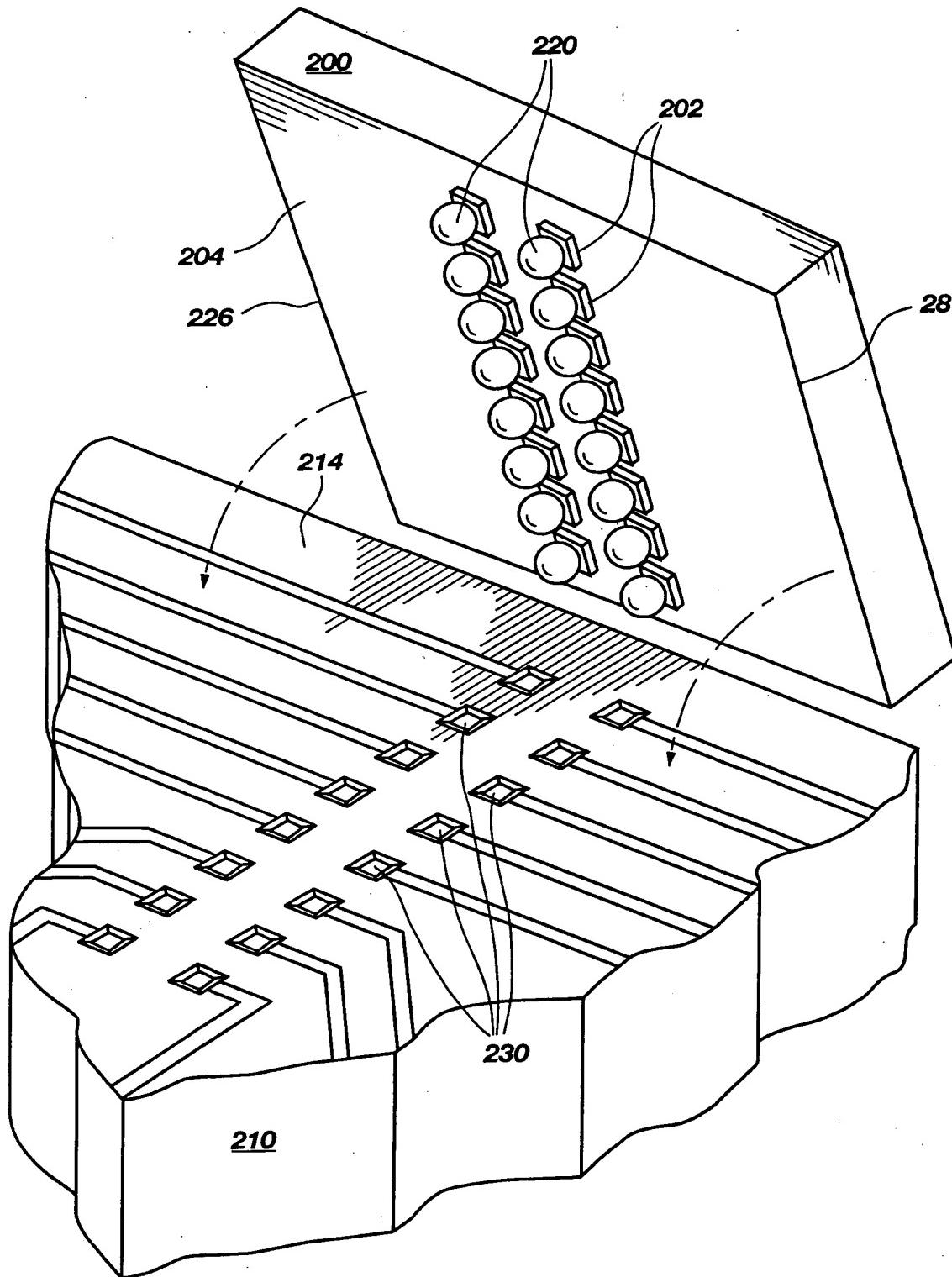
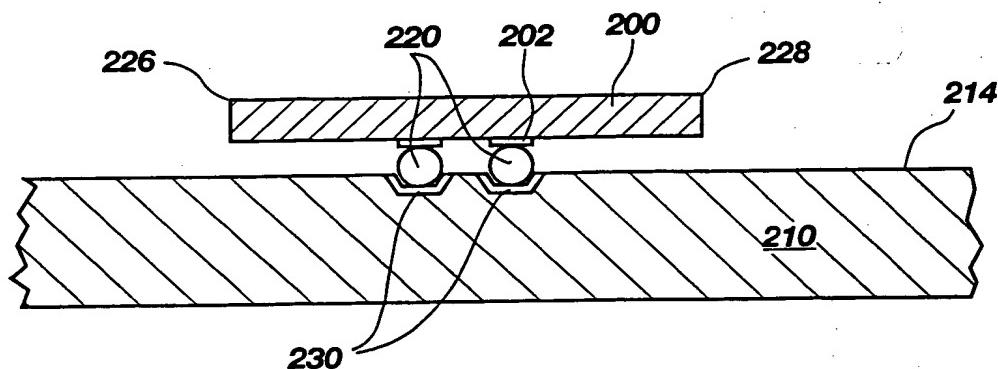


Fig. 1  
~~(PRIOR ART)~~

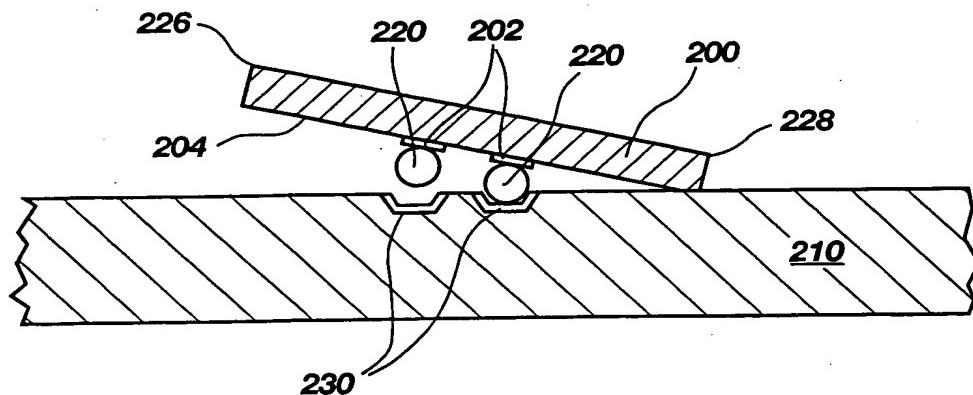
TITLE: STRUCTURES FOR STABILIZING SEMICONDUCTOR DEVICES RELATIVE TO  
TEST SUBSTRATES AND METHODS FOR FABRICATING THE STABILIZERS  
Serial No.: 09/590,527  
Docket No.: 2269-4101US  
ANNOTATED SHEET SHOWING CHANGES



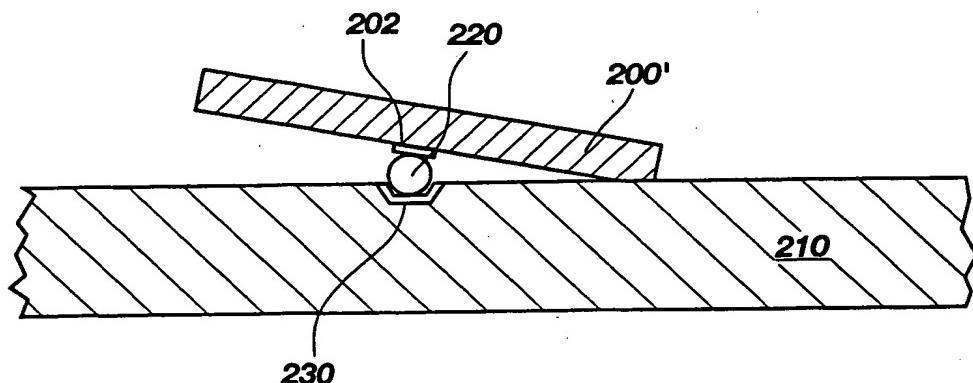
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**Fig. 2**  
~~(PRIOR ART)~~



**Fig. 3**  
~~(PRIOR ART)~~



**Fig. 4**  
~~(PRIOR ART)~~